Small Commercial Green Building Checklist

GREEN BUILDING in Alameda County

This Commercial Checklist is intended to address new construction and renovations/expansions up to 10,000 square feet or $3 million. Projects are recommended to meet all applicable measures on the checklist. For measures that are not applicable or are not in the project's scope of work, select "N/A" and make a note of why the measure does not apply to the project. For appendices, electronic copies of this checklist, and other green building resources, visit www.buildgreennow.org.

Project:

Address: **Date:**

Site

Access to alternative transportation sources reduces the number of single passenger vehicle trips, reduces traffic congestion, and saves fuel and associated greenhouse gas emissions. Allowing space for bike parking increases participation in alternative transportation services. Cool sites and roofs reduce the amount of heat stored and re-radiated during summer days in urban environments that contribute to higher energy use and pollution.

Yes	No	N/A	Measure & Requirement	Documentation	Notes
☐	☐	☐	**1. Alternative Transportation Access** Project is located within 1/4 mile of two or more bus lines AND/OR within 1/2 mile of a light rail or commuter rail transit stop (BART, Amtrak, etc.). Project also includes bicycle racks or storage areas for use by building occupants (workers) in a secure and covered area. If the project is in a high use public area, provide bicycle racks and/or storage options for visitors to the building as well. Provide bike racks or storage area capable of securing at least 1 bike for every 2,000 sf of building space.	1. Provide a simple map showing distances to public transit stops from the main entry of the buildings. Use the "Nearby Routes & Services" calculator on the www.511.org website or other transit agency website to calculate distances from the project address. 2. Provide a site plan that shows bike rack/storage locations. Highlight or circle the bike racks/storage areas and provide a total number of bikes able to be parked at the site. Bike racks dedicated to building occupants (workers) should be in a covered and secure location.	
☐	☐	☐	**2. Reduced Parking** Project does not exceed minimum local parking requirements OR the project does not provide any new parking.	1. Provide proof of the minimum local parking requirements for the site OR provide proof that no parking will be added. Minimum parking requirements usually come from the City. 2. If parking is added, provide a site plan with parking areas highlighted. Total and highlight the number of existing and new parking spaces.	
☐	☐	☐	**3. Reduced Heat Island Effect** Combine cool roof and/or cool site techniques for 75% of site area being impacted by construction (including roof and all landscaping/hardscapes on site). Cool roofs are reflective surfaces applied to the roof. To find cool roof products, go to www.coolroofs.org and use the "Rated Products Directory". Cool site techniques include pervious surfaces (including open grid pavement and vegetation) and light colored concrete.	1. Site plan with the following areas calculated and clearly visible (if applicable): total site area, building/roof area, photovoltaic array area, landscape area, area of hardscapes under shade (from trees or awnings, etc.), and hardscape area. 2. Calculate the percent of the total site area that includes cool roof and/or cool site techniques. Photovoltaic panels can be exempt from the calculation if mounted on the roof or if they shade hard surfaces (subtract the photovoltaic array area from the total site area). For low-sloped roofs (<2:12), eligible cool roof materials must have a Solar Reflective Index (SRI) of 78 or higher. If SRI is not available for the cool roof product, then products with an initial solar reflectance of 0.70 or higher AND an initial thermal emittance of 0.75 or higher are acceptable. Steep sloped roofs (>2:12) do not need to comply and should have their square footage removed from calculation. 3. Provide manufacturer literature stating the cool roof SRI.	

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Water

Water-efficient fixtures reduce water use and sewer costs and reduce demand on water supplies and treatment facilities. For sites that have landscapes, see the Bay-Friendly for Permitted Landscapes checklist at www.buildgreennow.org.

Yes	No	N/A	Measure & Requirement	Documentation	Notes
☐	☐	☐	**4. Water Efficient Plumbing Fixtures** The following performance thresholds are required for all new fixtures: 1. Toilets: High Efficiency Toilets (HETs) with flush rate ≤1.28 gallons per flush (gpf). 2. Urinals: Waterless or low-flow with flush rate ≤ 0.5 gpf. 3. Faucets: flow rates ≤ 1.5 gallons per minute (gpm) for all faucets except kitchen sinks. 4. Pre-rinse Spray Valves: flow rates ≤ 2.0 gpm.	1. Floor plan(s) with fixture schedule(s) showing location of all new toilets, urinals, faucets and kitchen pre-rinse spray valves in the project. Include flow rates in the fixture schedule. 2. Specification sections showing that low-flow fixtures are specified for all new fixtures (if specifications are created for the project). 3. Manufacturer literature (cut sheets) showing flush rate of toilets and urinals to be installed, and flow rates for faucets and spray valves.	

Energy

Exceeding energy efficiency minimums results in reduced greenhouse gas emissions, lower utility costs and increased comfort. Another benefit is higher quality construction, thanks to better air sealing, increased insulation, and high efficiency equipment.

5. Improved Energy Efficiency

There are 2 paths for achieving this measure:
Path 1. Performance: For buildings that require Title 24 energy modeling, complete Path 1. Check "N/A" in the Path 2 box.
Path 2. Prescriptive: For projects that do not require energy modeling, complete Path 2. Check "N/A" in the Path 1 box.

Yes	No	N/A	Measure & Requirement	Documentation	Notes
☐	☐	☐	Path 1: Building Energy Modeling Beat California minimum energy efficiency standards (Title 24, Part 6) by 10% or more.	1. Submit Title 24 report for whole building or by component. Percent better than code is determined by TDV from ECON-1 report.	
☐	☐	☐	Path 2: For projects that DO NOT require building energy modeling: Complete A&B below.		

A. Select at least 2 of the following prescriptive energy efficiency measures

	Measure & Requirement	Documentation	Notes
☐	i. Reduce Lighting Power Density (LPD) in the facility to 90% of code.	1. Provide lighting design plans and/or specifications. 2. Calculate the total LPD and include on plans or in other format. The LPD can be calculated from lighting design plans or from Title 24 submissions. Must be a maximum of 90% of Title 24 LPD. Do not include occupancy sensor or other switches/control strategies in this calculation.	
☐	ii. Verify outside air economizer operation.	1. Evaluate economizer operation upon startup. Confirm operation of actuator from minimum position to 100% open. 2. Verify economizer operates per control sequence (outside air, room set point) to meet space requirements.	
☐	iii. High performance windows - for all windows replaced.	1. Provide plans and/or specifications with window schedule. All new windows must be NFRC rated and have a U-factor no higher than 0.40. Solar Heat Gain Coefficient (SHGC) is dependent on glazing percentage, for buildings with less than 20% glazing, SHGC should be no higher than 0.45. For buildings with more than 20% glazing, SHGC should be no higher than 0.35. 2. Provide manufacturer cut sheets or other documentation of NFRC label for windows chosen.	
☐	iv. All new or replaced windows have low-conductivity frames. Metal frames do not qualify, except those with thermal breaks.	1. Provide window schedule or specifications showing all new or replaced windows frames are vinyl, fiberglass, thermally-broken metal, or other non-metal. 2. Provide manufacturer cut sheet illustrating frame type.	

Yes	No	N/A	Measure & Requirement	Documentation	Notes
☐			v. High Efficiency HVAC Equipment. All new HVAC equipment must comply with the Consortium for Energy Efficiency (CEE) Tier 1 commercial HVAC standards. See www.buildgreennow.org for a link to the CEE standards or download them at www.cee1.org/com/com-main.php3.	1. Provide plans and specifications showing equipment schedule and performance specifications. 2. Provide manufacturer literature confirming compliance with CEE Tier 1 standards.	
☐			vi. Provide on-site renewable energy generation (solar, wind, etc) system capable of producing at least 5% of the building's total electrical load OR at least 10% of the building's hot water demand.	1. Provide estimated output and percent of building load to be offset with renewable energy system. Calculations to be provided by a licensed solar installer, electrical contractor, or from the CEC rebate application. 2. Provide manufacturer cut sheets for solar panels. If photovoltaics are installed, provide cut sheet for inverter(s).	
			B. Select at least 3 of the following prescriptive energy efficiency measures		
☐			i. Automatic daylight sensors are installed in at least 75% of spaces with exterior non-north facing windows. Automatic sensors must turn lights on, off, or dim depending on amount of daylight. (B.i and B.iii cannot both be attained on the same project).	1. Highlight areas to be daylit on plans (those areas or rooms within 15 feet of skylights or exterior, non-north windows). 2. Highlight locations of daylight sensors. 3. Provide calculation showing that 75% or more of the space in daylit areas (by square feet or rooms) are under daylighting control.	
☐			ii. Locate occupancy sensors in 40% of intermittent or non regularly occupied spaces (hallways, bathrooms, closets, private offices). Exclude areas containing mechanical equipment or electrical panels which require light for maintenance activities.	1. Provide lighting plans with intermittent/non-regularly occupied spaces highlighted. 2. Highlight occupancy sensors on plans that serve these spaces. 3. Provide calculation showing that 40% or more of the spaces are controlled by occupancy sensors.	
☐			iii. Multi-level switching in all "daylit" areas (B.i and B.iii cannot both be attained on the same project).	1. Provide lighting plans with daylit areas highlighted (those areas within 15 feet of skylights or exterior, non-north windows). 2. Confirm electrical design allows for multi-level switching.	
☐			iv. All new exit signs in the project are to be LED or nuclear. Recommend replacing all existing exit signs as well, even if not in project scope.	1. Provide lighting plans specifying correct signage product.	
☐			v. Install ENERGY STAR rated office equipment and appliances. For eligible equipment, at least 75% of all new office equipment and 90% of all new appliances must be ENERGY STAR rated. See www.energystar.gov for product lists.	1. Submit list of all planned new office equipment and appliances. 2. Calculate the percent of planned office equipment and appliances that are to be ENERGY STAR. If ENERGY STAR products are not available for a particular appliance or piece of equipment, note that on the list and do not include those in the percentage calculation.	
☐			vi. High efficiency heating: If new furnaces are specified, they will have a minimum energy efficiency of 92 AFUE.	1. Submit plans or specifications highlighting efficiency of forced air furnace(s). 2. Submit manufacturer cut sheet for furnace(s) and highlight efficiency.	
☐			vii. High efficiency water heating: Specify gas water heaters above 0.65 EF or preferably a condensing hot water heater at 0.86. Avoid electric hot water heaters. Specify boilers with efficiency of 90% or more. (This excludes all tankless water heaters and any small kitchen or bathroom water heaters under 5 gallons.)	1. Submit plans or specifications highlighting efficiency of water heater(s) or boiler(s). 2. Submit manufacturer cut sheet for water heaters/boilers and highlight efficiency.	

Yes	No	N/A	Measure & Requirement	Documentation	Notes
☐			viii. Tight ducts: Duct testing and sealing for all ductwork.	1. Submit evidence that duct sealing and testing will be performed. This could be in the specifications; be a HERS duct testing contract or report; or other documentation that ducts will been sealed and tested. 2. Provide final duct testing report.	
☐			ix. Develop and implement an Operations & Maintenance (O&M) Plan for the building. Download a guide to green O&M at www.StopWaste.Org/EPP.	1. Develop an O&M plan for the project. The plan should address all that apply: building lighting, heating, cooling, plumbing, solar, rainwater catchment, irrigation/landscaping practices and other systems as well as more general building policies (such as green cleaning, environmental purchasing, etc). The plan should describe accessibility of units, proper maintenance techniques, descriptions of proper use, model numbers & cut sheets, manufacturer contact information for replacement/repair/questions. The plan should include switching/controls diagrams, lighting plans, heating, cooling, plumbing, solar, rainwater, irrigation/landscaping practices. 2. Submit signed O&M plan from the owner saying that the O&M plan will be followed once occupied.	

Materials

Construction materials constitute about 22% of the disposed waste stream statewide. Many of these materials can be reduced, reused or recycled. Recycling reduces the amount of material entering landfills and can save money for building owners through reduced disposal and operating fees. Buying environmentally preferable new products can reduce the impact on raw materials extraction and disposal at end of life.

Yes No N/A

☐ ☐ ☐ **6. Construction Waste Management**

During construction, divert 100% of concrete and asphalt concrete and divert at least 65% of remaining job site construction waste from landfill via recycling or reuse.	1. Prior to construction, complete a construction waste management plan. The City should provide a sample template, or one can be downloaded at www.buildgreennow.org. 2. After construction, provide final waste management plan and verification (service provider weight tags and/or receipts) that 100% of concrete and asphalt concrete were diverted and at least 65% of remaining job site construction waste diverted from landfill via recycling or reuse. If material was taken to a transfer station, a facility average recycling rate must be applied to the amount of material sent to that facility.	

☐ ☐ ☐ **7. Environmentally Preferable Materials**

Achieve at least 5 Environmentally Preferable Materials from i-xiv below.

Materials or finishes listed below meet at least one of the following environmentally preferable criteria: Plywood/MDF/wood is FSC certified; salvaged/reclaimed materials (including onsite materials); flyash in concrete; rapidly renewable materials (bamboo, etc); recycled content materials (at least 40% combined pre and post consumer); exposed concrete (for flooring only); or low-emitting (Volatile Organic Compounds (VOCs) and other chemicals. See www.buildgreennow.org for links and resources on Environmentally Preferable Materials.

☐ i. Cabinets & Shelving (includes boxes, face frames and doors). *At least 50% of cabinets and shelving (by volume or linear feet) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material (recycled content %, FSC certification, etc.). 3. Provide calculation of applicable material percentage.	
☐ ii. Interior Trim (includes all trim for floors, doors, walls, ceilings, windows, wainscot). *At least 50% of all interior trim (by volume or linear feet) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	

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☐			iii. Doors and Door Cores *At least 50% of all doors (by count) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	
☐			iv. Countertops and Substrates. *At least 50% of all countertops and substrates (by volume or linear feet) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	
☐			v. Furniture (Includes systems and stand-alone furniture). *At least 75% of all furniture (by number of pieces or by cost) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of furniture. 3. Provide calculation of applicable material percentage.	
☐			vi. Ceiling Tiles. *At least 75% of all ceiling tile (by square feet) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	
☐			vii. Insulation. *At least 75% of all insulation (by volume, square feet, or cost) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	
☐			viii. Flooring. *At least 50% (by square feet) of all flooring (exposed or stained concrete) or floor coverings (carpet, resilient flooring, tile, hardwood, etc.) meet environmentally preferable criteria.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide calculation of applicable material percentage.	
☐			ix. Flyash in Concrete *Achieve 15% flyash as percentage of portland cement for all new concrete poured.*	1. Provide proposed mix designs showing flyash as percentage of portland cement. 2. Provide calculation showing planned 15% flyash for total new poured concrete (ensure that flyash is percentage of portland cement).	
☐			x. Exterior Paint. *At least 50% of all exterior paint (by square footage or volume) is recycled content (40%+).*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature showing recycled content. 3. Provide calculation of applicable material percentage.	
☐			xi. Low-Emitting Interior Paint. *All interior paints are low emitting: ≤ 50 grams/liter for flat paints, ≤ 150 g/L for non-flat paints and other coatings.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide documentation that all paints and coatings are low-emitting. Provide MSDS sheets.	
☐			xii. Low-Emitting Adhesives & Sealants. *All adhesives and sealants are low-emitting according to the South Coast Air Quality Management District Rule 1168 (see www.aqmd.gov/rules/reg/reg11/r1168.pdf for VOC limits).*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide documentation that all adhesives and sealants are low-emitting. Provide MSDS sheets.	

Yes	No	N/A	Measure & Requirement	Documentation	Notes
	☐		xiii. Low-Emitting Carpeting. *All carpeting, carpet pads, and adhesives are certified Green Label Plus per the Carpet and Rug Institute (CRI). See www.carpet-rug.org for label requirements and product lists.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide CRI Green Label Plus documentation.	
	☐		xiv. Low-Emitting Composite Wood. *All interior composite wood (MDF, plywood, particleboard, etc.) contain no added urea formaldehyde.*	1. Provide finish schedule or specifications with applicable material(s) highlighted. 2. Provide manufacturer literature to support environmental claims of material. 3. Provide MSDS sheets of composite wood.	

8. Collection of Recyclables

☐	☐	☐	Encourage ongoing recycling by providing at least as much bin volume for recycling as for waste. Additionally, recycle at least 5 of the following material streams: glass, plastic, cardboard, aluminum, food scraps, hazardous waste (fluorescent lamps, batteries, oil, etc.), and e-waste (computer equipment).	1. Provide plans showing recycling receptacles are provided in all applicable areas: offices, private rooms, meeting rooms, kitchens, etc. 2. Provide calculation of adequate recycling volume. 3. Provide evidence of recycling for at least 5 of the material streams. Submit recycling hauler information for recyclables and food scraps. Provide a short narrative on how the facility will collect and recycle hazardous and e-waste.	

Indoor Environment & Air

Effective daylighting and natural ventilation may improve indoor environmental quality. Natural ventilation can reduce heating and cooling requirements and may justify smaller, simpler HVAC systems, which can reduce the project's first costs. Ventilation (natural or mechanical) improves indoor air quality. Daylighting can offset some of the electric lighting load.

9. Daylight, Views & Natural Ventilation

Yes	No	N/A			
☐	☐	☐	Provide access to views to the outdoors (any window or skylight can provide a view) from 80% of regularly occupied areas. Operable windows are recommended for all projects; required if 2 or more walls have windows or access to outdoor air and there is not a security compromise by having operable windows.	1. Provide site plans with view areas highlighted (those areas within sightline of skylights or exterior windows). 2. Calculate percent of regularly occupied areas with/without access to views. 3. Provide window schedule showing operable and non-operable windows.	

10. Fresh Air Monitors for Densely Occupied Spaces

☐	☐	☐	For systems with moveable outside air dampers: For all densely occupied spaces, such as multi-purpose rooms or conference rooms, provide CO2 monitors with alarms (example: small visual indicator such as a light to alert building occupants or building operator), and the ability to manually adjust air flow.	1. Provide mechanical plans with CO2 monitors highlighted. 2. Confirm alarm function (user adjustable) of Building Automation System. Verify control sequence resulting from "alarm" in Sequence of Operations. 3. Provide Title 24 "Acceptance" forms. 4. Written confirmation that testing, adjusting and balancing (TAB) contractor will adjust and balance the moveable outside air damper to provide cooling as required for air conditioning the space. When CO2 monitor located within referenced AC unit's conditioned space sends an alarm signal the economizer damper actuator shall open outside air damper to provide 30% more air than the minimum damper setting.	